Case Reports

Coronary Artery Bypass Grafting in Patients with Systemic Lupus Erythematosus

Report of 2 Cases

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Systemic lupus erythematosus is an autoimmune disease that often involves the cardiovascular system. Coronary artery narrowing in patients with lupus erythematosus is severe, progressive, and related to the duration of the disease rather than to the age of the patient. Steroid use in such patients has improved their life expectancy but seems to be increasing the incidence of coronary involvement. Consequently, a larger number of systemic lupus erythematosus patients may be candidates for myocardial revascularization in the future.

We report our experience with myocardial revascularization in 2 women with severe systemic lupus erythematosus, incapacitating angina, and severe obstructive coronary artery disease. One of the women required balloon angioplasty 19 months after coronary artery bypass grafting and remains asymptomatic nearly 3 years later. The other patient is free of symptoms 9 months after surgery. Our results with these 2 patients are encouraging. Long-term follow-up should yield further information regarding the benefits of myocardial revascularization and coronary angioplasty in patients with systemic lupus erythematosus. ***(Tex Heart Inst J 1995;22:185-8)***

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Systemic lupus erythematosus (SLE) is an autoimmune disease that can affect all organ systems. Involvement of the cardiovascular system in SLE can lead to death and usually occurs in young patients (less than 40 years of age).[1,2]

Recent reports have stressed the significant relative increases in morbidity and mortality in patients with SLE when there is cardiovascular involvement.[3,4] Many of these patients experience severe angina or myocardial infarctions and their sequelae. Despite widespread use of myocardial revascularization in the general population, there are few reports of coronary artery bypass grafting (CABG) in patients with SLE.[3,4]

We report our experience with myocardial revascularization in 2 women with severe SLE, incapacitating angina, and severe obstructive coronary artery disease.

Case Reports

Patient 1

The patient is a 26-year-old woman with an 8-year history of SLE treated with steroids. From the cardiovascular standpoint, she was well until she began experiencing angina on minimum effort. Coronary angiography revealed excellent left ventricular function, but there were critical lesions of the left anterior descending coronary artery and the 1st obtuse marginal branch of the circumflex coronary artery (Fig. 1), as well as the right posterior descending coronary artery (Fig. 2). Because of her incapacitating angina, coronary artery bypass was recommended for this patient. On 13 December 1990, the patient underwent CABG. The left internal mammary artery was dissected and found to be free of palpable occlusive disease, with excellent flow. Its distal portion was found to be histologically normal by frozen section biopsy (Fig. 3).

We implanted saphenous vein grafts to the right posterior descending coronary artery and the 1st obtuse marginal branch, and we used a left internal mammary

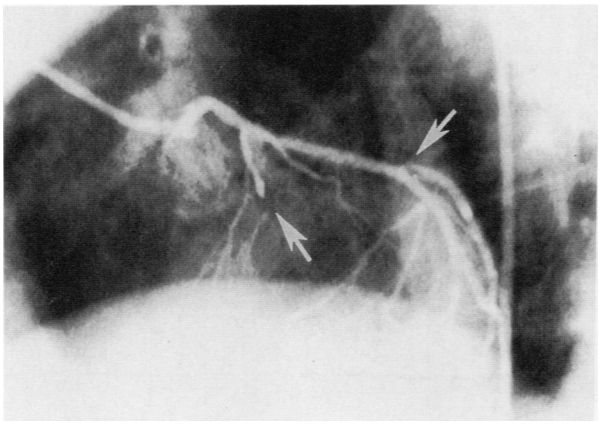

Fig. 1 *Preoperative angiogram showing critical lesions of the left anterior descending and the 1st obtuse marginal coronary arteries.*

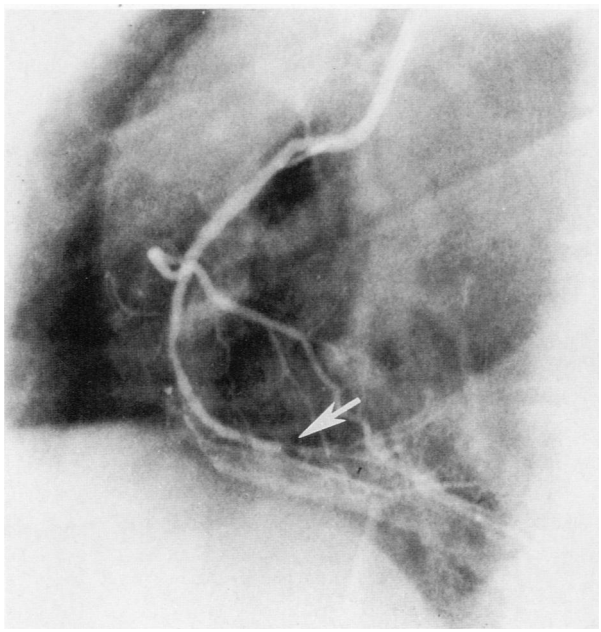

Fig. 2 *Preoperative angiogram showing a critical lesion of the right posterior descending coronary artery.*

artery for revascularization of the left anterior descending coronary artery. The operation was uneventful and the patient had an essentially normal convalescence with the exception of a small pneumonic infiltrate of the right lung and a superficial wound abscess on the right leg. Both conditions responded rapidly to antibiotics. The total postoperative hospital stay was 11 days. The patient returned to her job as a nurse and was completely asymptomatic. After 18 months, she returned for a follow-up stress test, the results of which were completely normal. Two weeks later, she was readmitted due to severe chest pain with no electrocardiographic or enzymatic evidence of infarction. Coronary angiography showed that the left internal mammary artery graft (Fig. 4) and the graft to the circumflex system (Fig. 5) were patent. The posterior descending coronary artery graft was occluded (Fig. 6). A few days later, the patient underwent several repetitions of balloon angioplasty dilation of the native right coronary artery, with excellent results (Fig. 7). She was discharged from the hospital 2 days later. An echocardiogram performed 9 months after the coronary angioplasty showed an ejection fraction of 60% with mild left ventricular apical hypokinesis. Four and one half years after surgery and 2 years, 10 months after the balloon angioplasty, the patient remains asymptomatic; during that interval, she has written and published a book.

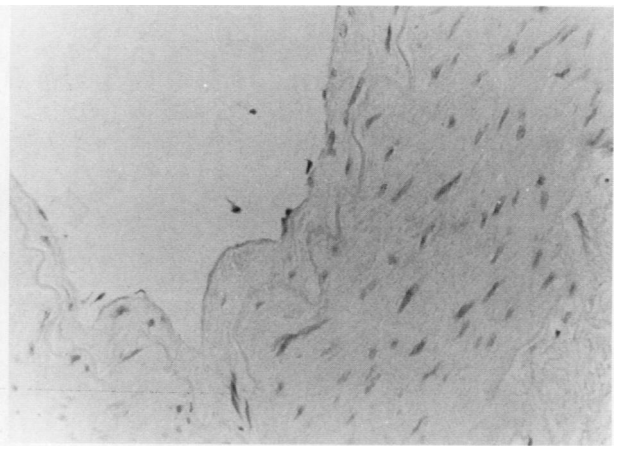

Fig. 3 *Biopsy of the left internal mammary artery showing no evidence of involvement by systemic lupus erythematosus.*

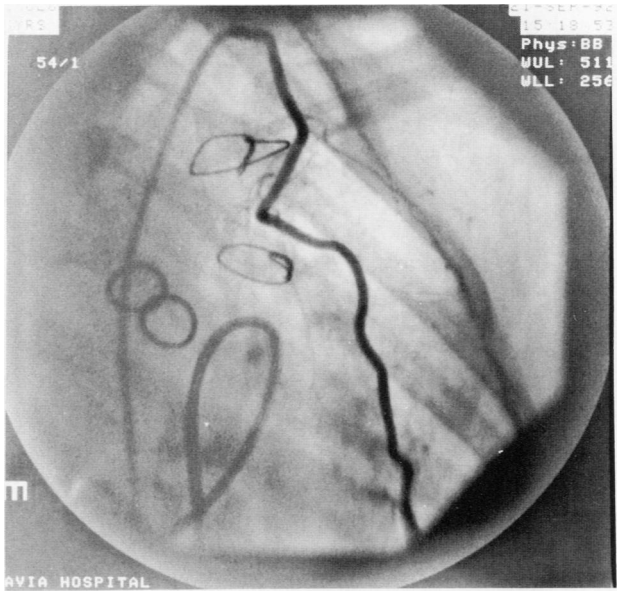

Fig. 4 *Patent left internal mammary artery graft to the left anterior descending coronary artery.*

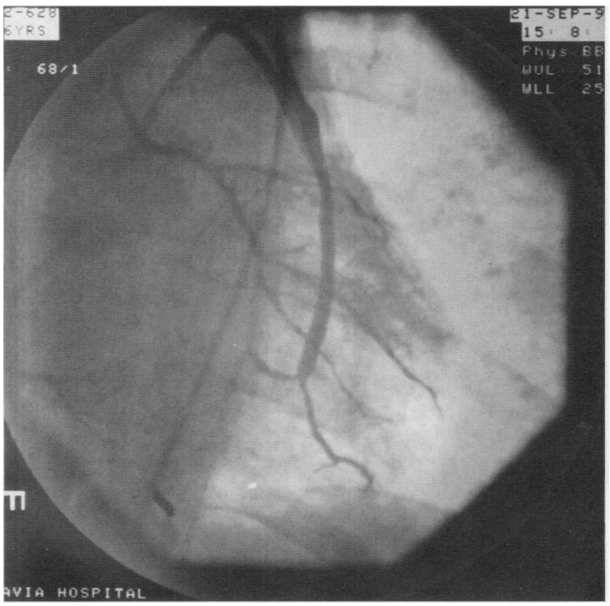

Fig. 5 *Patent vein graft to the obtuse marginal coronary artery.*

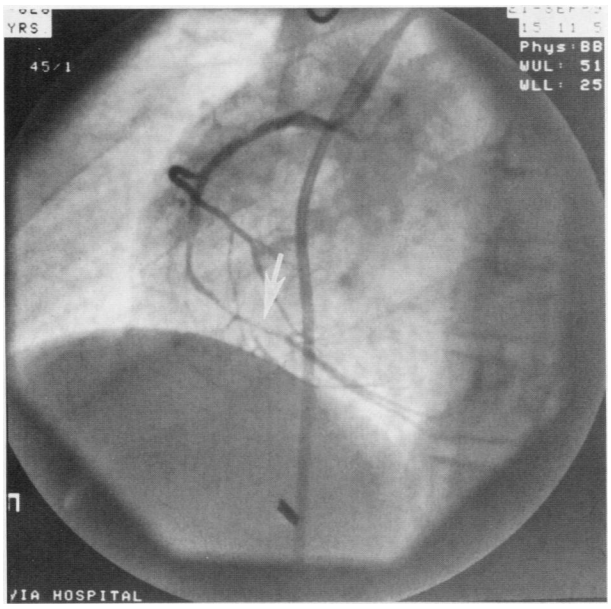

Fig. 6 *Right coronary artery arteriogram. The graft is occluded, and significant coronary narrowing is evident.*

Patient 2

This 67-year-old woman had SLE that had been treated with steroids for 15 years. She developed unstable angina that was unresponsive to medical treatment of 1 month's duration. A cardiac angiogram revealed severe triple-vessel coronary artery disease with distal vessels deemed possible to bypass. Her ejection fraction was 60%.

On 12 August 1994, she underwent CABG. A biopsy of the left internal mammary artery showed no evidence of involvement by the disease process. She had 5 bypasses of the coronary arteries: left internal mammary artery to left anterior descending coronary artery; and saphenous vein grafts to the diagonal, 1st, and 2nd obtuse marginals, and to the right posterior descending coronary artery. The distal vessels were found to be free of notable disease. The surgical procedure as well as the postoperative period was uneventful.

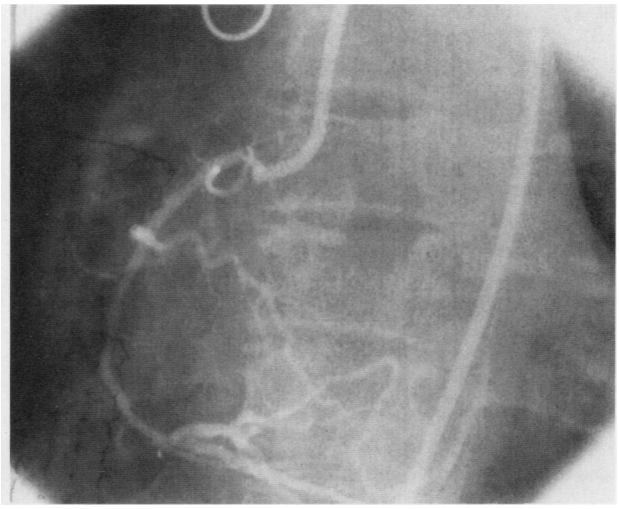

Fig. 7 *The right coronary artery after successful dilation.*

The patient was discharged from the hospital 6 days after surgery and remains essentially asymptomatic 9 months later.

Discussion

Severe coronary artery narrowing is a well-known effect of SLE. The narrowing could be due to arteritis, atherosclerosis, or both. Before the advent of steroid treatment for SLE, diffuse arteritis was the most common presentation. After 1 year of steroid treatment, the incidence of focal atherosclerotic lesions (such as stenosis and aneurysm formation) increased, despite improvement of the intimal proliferation.[5-7] In either form, the coronary disease is severe, progressive, and related to the duration of SLE rather than to the age of the patient. The occurrence of acute myocardial infarction is common in SLE patients less than 35 years of age, and even teenagers are affected. Heart failure, sudden death, and angina pectoris follow acute myocardial infarction as the most common initial cardiac manifestations and contribute, along with the other cardiac (endocarditis, myocarditis, and pericarditis) and noncardiac manifestations of SLE, to a drastically shortened life expectancy.[2]

Reports of coronary revascularization in patients with SLE are few. Several problems complicate the issue of whether to use myocardial revascularization

in patients with SLE, for example, whether coronary artery bypass surgery should be performed in a patient who has compromised life expectancy due to multisystem involvement and concomitant likelihood of postoperative complications, such as poor healing due to steroid use. The type of conduit to use for the bypass operation is also important to consider. The few reports available in the literature do not provide any meaningful conclusions about the use of autogenous saphenous vein grafts, internal mammary grafts, or both, for revascularization in SLE patients. In 2 cases from the Japanese literature,[3,8] bypasses were performed with internal mammary arteries. However, the authors reported that they were concerned about using this conduit because of the possibility of arteritis. They have yet to report the long-term results.

Our patients were treated with a left internal mammary artery graft after a biopsy revealed noninvolvement by SLE. The excellent angiographic appearance of the left internal mammary artery bypass to the left anterior descending coronary artery in patient 1 is very encouraging, although this no guarantee that the graft will not develop intimal hyperplasia in the future.

To our knowledge, ours is the only reported case of an SLE patient (Patient 1) having undergone myocardial revascularization followed by percutaneous transluminal coronary angioplasty (PTCA) of a bypassed native vessel. The outcome of coronary arteries treated by PTCA in patients who have SLE is not known. In this patient, the successful PTCA avoided reoperation, and the patient remains asymptomatic nearly 3 years after the procedure.

The improved medical management of patients who have SLE has increased their life expectancy. However, large-dose, long-term corticosteroid therapy appears to raise the incidence of coronary involvement.[9] Consequently, a larger number of patients may be candidates for myocardial revascularization in the future. The use of PTCA in patients with SLE is not well documented. Wilson and colleagues[10] reported 2 cases of patients with SLE and acute myocardial infarction who were treated with PTCA. Both of them sustained reocclusion of the dilated vessel and 1 died. Physicians must analyze the risk–benefit ratio of life expectancy and other organ involvement before proceeding with myocardial revascularization. The patient's chances for survival, good functional result, and rehabilitation must all be evaluated. With regard to the question of which conduit to use, we believe that if the left internal mammary artery is free of arteritis it should be considered for myocardial revascularization until evidence to the contrary is discovered.

Our experience with Patient 1 suggests that PTCA could be utilized in patients with SLE when difficulties arise. Its use in our patient proved extremely helpful, by preventing, or at least delaying reoperation. Whether PTCA can be used as primary therapy or secondary to failure of coronary artery bypass grafting remains to be seen as experience is accumulated. Continued long-term follow-up of this patient will be most illustrative.

References

1. Mandell BF. Cardiovascular involvement in systemic lupus erythematosus. Semin Arthritis Rheum 1987;17:126-41.
2. Doherty NE, Siegel RJ. Cardiovascular manifestations of systemic lupus erythematosus. Am Heart J 1985;110:1257-65.
3. Sakamoto S, Shimizu T, Kaneto Y, Toyoda T. [A case of coronary artery bypass grafting using bilateral mammary arteries in a patient with systemic lupus erythematosus.] Nippon Kyobu Geka Gakkai Zasshi 1990;38:116-20.
4. Homcy CJ, Liberthson RR, Fallon JT, Gross S, Miller LM. Ischemic heart disease in systemic lupus erythematosus in the young patient: report of six cases. Am J Cardiol 1982;49:478-84.
5. Bulkley BH, Roberts WC. The heart in systemic lupus erythematosus and the changes induced in it by corticosteroid therapy. A study of 36 necropsy patients. Am J Med 1975;58:243-64.
6. Bonfiglio TA, Botti RE, Hagstrom JW. Coronary arteritis, occlusion, and myocardial infarction due to lupus erythematosus. Am Heart J 1972;83:153-8.
7. Bidani AK, Roberts JL, Schwartz MM, Lewis EJ. Immunopathology of cardiac lesions in fatal systemic lupus erythematosus. Am J Med 1980;69:849-58.
8. Masaki H, Fujiwara T, Nogami A, Yamamoto T, Yamane H, Kanazawa S, et al. [Aortocoronary bypass surgery in a case of systemic lupus erythematosus and calcified aorta.] Kyobu Geka 1988;41:142-6.
9. Yoshimoto K, Saima S, Nakamura Y, Ishikawa H, Kinoshita M, Yokohari R, et al. [A case of acute dissecting aneurysm of the aorta in systemic lupus erythematosus.] Nippon Jinzo Gakkai Shi 1989;31:1211-6.
10. Wilson VE, Eck SL, Bates ER. Evaluation and treatment of acute myocardial infarction complicating systemic lupus erythematosus. Chest 1992;101:420-4.